

Product information

BRF Series

Heavy metal and lithium-free glass enamels for returnable bottles.

Variety of colour shades

Intermixable colour palette^[1]

Various application methods

Glossy surface appearance

BRF Series colours

Part Number	Description
BRF000	White
BRF250	Citrus yellow
BRF300	Red
BRF455	Green
BRF401	Turquoise
BRF402	Chrome green
BRF500	Blue
BRF600	Black
BRF707	Autumn brown
BRF730	Rust brown
BRF750	Chocolate brown
BRF900	Etch

The BRF Series consists of an intermixable^[1] colour palette that can be blended to make an infinite variety of customized colour shades.

BRF Series extended colour range*

Part Number	Description
BRF201	Yellow
BRF301	Flaming red
BRF302	Orange
BRF306	Ruby red

**The extended colour range is cadmium containing.*

End user trials are always recommended for the introduction of new colour mixtures especially when using colours from the extended colour range.

The colours of the BRF Series can be supplied as:

- Powder
- I.R. drying, water friendly or oil based, screen print paste
- Thermoplastic screen print paste
- I.R. drying, water-miscible spray paste

[1] -Colours from other ranges should not be mixed with the BRF Series.

Application

Medium Type	Oil Based IR Medium	Water Friendly IR Medium	Thermoplastic	Spraying
Recommended medium	63 - 485	654 - 63	64 - 64	65 - 439
Recommended thinner	RM.362	RM.444	64 - 64	Water
Powder/medium ratio	3,5 : 1	3,5 : 1	4,2 : 1	3 : 1
Viscosity	15 - 20 Pa.s	15 - 20 Pa.s	1,0 - 1,8 Pa.s	15 - 25 sec
Printing temperature	15 - 25°C	15 - 25°C	60 - 80°C	15 - 25°C
Humidity	30 - 60%	30 - 60%	30 - 60%	n/a
Screen	61 - 90	61 - 90	61 - 90	n/a
Wet film thickness	20 - 25 µm	20 - 25 µm	20 - 25 µm	1 - 20 g/bottle
Drying conditions	100 - 150°C	100 - 150°C	n/a	100 - 150°C

It is recommended that before decoration the glass should be at ambient temperature and completely clean and dry.

Firing

Type of Substrate	Firing Range °C	Firing Range °F	Notes
Glass	610 - 650	1130 - 1202	Fast Firing

Firing data based on laboratory kiln conditions

Chemical durability^[2]

Acid resistance

Test results: Passes the Coca-Cola® requirement.

The applied material does not show change in colour nor any loss of gloss after 24 hours in a 2,5 % solution (by volume) of phosphoric acid at a temperature ranging between 21° and 27°C.

Acid resistance

Assessment according to ASTM C735-93,

10 % HCl, 20 minutes at room temperature.

Grade: 4 to 5

Alkaline resistance

Assessment according to ASTM C675-91,

10 % NaOH, 2 hours at 88°C.

Grade: 5 to 6 cycles; Passes the Coca-Cola® requirement

After a continuous and uninterrupted immersion in the test solution at 88°C ± 2° for a period of 8 hours, applied material does exhibit an appearance of complete opaqueness. Bottles may be withdrawn for examination every 2 hours if relative comparison is required.

Test solution:

Sodium Hydroxide	9 % by weight
Tri-Sodium Phosphate	1 % by weight
Distilled Water	90 % by weight

Dishwasher resistance

Assessment according to Johnson Matthey test KC-50.010,

'Winterhalter' Detergent solution @1.5 g/L tested at 61°C.

White: Result ≤ 100 cycles

Black: Result ≤ 100 cycles

[2] - Results based on selected BRF Series enamels tested and assessed under our laboratory conditions, for performance data of products not listed in this document please consult the individual technical data sheet, available on request.

Storage and handling

It is recommended that the glass enamels are stored in tightly sealed containers away from direct sunlight at an even temperature in the range of 5-35°C (41-95°F).

Under these conditions the enamel can be stored for reasonable periods, although storage for longer than 12 months is not recommended.

Water based medium should never be stored at temperatures < 0°C.

Health and safety

Good industrial hygiene and work practices should be adhered to when handling the products mentioned in this document. For detailed health and safety requirements, please consult the appropriate Material Safety Data Sheets.